

Office: FEM 3
Office HRS: MW 10:00-11:00, T 12:00-1:00 in LRC 106, or by appointment
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Math 10A-56030: Structures and Concepts in Mathematics I (3 Units)

Class meets: (1/12/09 – 3/13/09), MWF (1:00-2:50) RM# FEM 4

Text: Math for Elementary Teachers, Beckmann, 2nd ed. ISBN: 0-321-44717-4

Prerequisite: Math 103

Basic Skills Advisories: Eligibility for English 125 and 126.

Description

Designed for prospective elementary school teachers. Development of problem solving strategies and skills, number sequences, set theory, ancient numeration systems, number theory, rational and irrational numbers, computation algorithms, and applications of mathematics.

Expectations / Responsibilities

- Instructor**
- Provide the necessary instruction and model the quality of work to be successful in Math 10A.
 - Clearly communicate progress being made in a timely fashion.
 - Cancelled classes will be posted on Blackboard and the Reedley College website.

- Student**
- Turn **OFF** your phone.
 - Follow the class rule – **Be Nice**.
 - Learn the material that is taught and **get help** when necessary.
 - Complete at least 70% of the chapter's homework prior to each test.
 - Monitor the class Blackboard site regularly, provide a working e-mail address, and monitor grades online.
 - Students are responsible for officially dropping the class.

- Attendance**
- Be in each class on time from **REEDLEY** to **TIGERS**.
 - You may be dropped if you have more than 2 absences.

Grading

Scale **A** 90-100% **B** 80-89% **C** 70-79% **D** 60-69%

Tests 75% There will be three tests and a final. Each test is comprehensive. A homework score of at least 70% must be earned prior to each test. There are **no make-up tests**. A test may be taken early with prior approval.

Homework 20% Homework may be assigned online, from the text, or from handouts. **No late homework** is accepted.

Quizzes 5% Quizzes will be given at random. There are **no make-up quizzes**. There is **no extra credit**.

Important Dates

January 30, 2009	Friday	Last day to register for a full-term fall class
January 30, 2009	Friday	Last day to drop a fall full-term class to avoid a "W"
February 17, 2009	Friday	Last day to change a class to/from Pass/No Pass
March 13, 2009	Friday	Last day to drop a full-term class to avoid a grade
March 13, 2009	Friday	Final Exam 1:00-2:50

NOTE: If you have a verified need for an academic accommodation or materials in alternate media (i.e., Braille, large print, electronic text, etc.) per the Americans with Disabilities Act or section 504 of the Rehabilitation act please contact me as soon as possible.

Please refer to SCCCD policies for guidance on all matters relating to this course.

ACADEMIC DISHONESTY

Cheating is the act or attempted act of taking an examination or performing an assigned, evaluated task in a fraudulent or deceptive manner, such as having improper access to answers, in an attempt to gain an unearned academic advantage. Cheating may include, but is not limited to, copying from another's work, supplying one's work to another, giving or receiving copies of examinations without an instructor's permission, using or displaying notes or devices inappropriate to the conditions of the examination, allowing someone other than the officially enrolled student to represent the student, or failing to disclose research results completely.

Plagiarism is a specific form of cheating: the use of another's words or ideas without identifying them as such or giving credit to the source. Plagiarism may include, but is not limited to, failing to provide complete citations and references for all work that draws on the ideas, words, or work of others, failing to identify the contributors to work done in collaboration, submitting duplicate work to be evaluated in different courses without the knowledge and consent of the instructors involved, or failing to observe computer security systems and software copyrights. Incidents of cheating and plagiarism may result in any of a variety of sanctions and penalties, which may range from a failing grade on the particular examination, paper, project, or assignment in question to a failing grade in the course, at the discretion of the instructor and depending on the severity and frequency of the incidents.

COURSE OUTCOMES:

After the completion of this course, students will be able to:

- A. Apply the four-step problem solving process with various strategies in order to solve application problems. Identify and develop the algebraic formula for the n th term of a variety of sequences.
- B. Perform operations on sets, use Venn diagrams to describe relationships between sets and solve problems, and use sets to describe the process of counting and arithmetic operations.
- C. Describe ancient numeration systems and the development of our current numeration system. Perform arithmetic operations in positional systems other than base ten and explain the basis of the common arithmetic operation algorithms.
- D. Describe the tests for divisibility of natural numbers and their algebraic justification. Compute the greatest common factor (GCF) and least common multiple (LCM) using prime factorizations and algebraically describe the relationship between the two.
- E. Identify the location of rational numbers on the number line and demonstrate the role the GCF and the LCM play in the algorithms for operations on the rational numbers.
- F. Recognize the difference between rational and irrational decimal numbers and how to determine their positions on the number line. Apply the properties of exponents to explain the role powers of 10 play in the algorithms for operations on decimals. Perform algebraic conversions of nonterminating, repeating decimals.

COURSE OBJECTIVES

In the process of completing this course, students will:

- A. Apply inductive and deductive reasoning to solve various types of problems using a variety of problem solving methods including, but not limited to, making a table, looking for a pattern, draw a picture, work backwards, guess and check and algebraic equations.
- B. Use set theory and Venn diagrams to model information
- C. Study ancient numeration systems and positional systems other than base ten in order to appreciate the historical foundation of mathematics and to understand the basis and merit of our base ten numeration system.
- D. Learn and apply basic properties of number theory to solve problems.
- E. Develop an understanding of the set of rational numbers as a subset of the reals and the algorithms used to perform operations on the rational numbers.
- F. Understand the relationship between rational and irrational decimal numbers and the basis for the algorithms used to perform operations on decimal numbers.
- G. Apply the concepts of decimals, ratios and proportions to solve application problems.

COURSE OUTLINE

- A. Problem Solving
 - 1. Inductive and Deductive reasoning
 - 2. Polya's steps for problem solving
 - 3. Sequences, including but not limited to, arithmetic and geometric sequences
 - 4. Equations and applications
- B. Sets, whole numbers, relations and functions
 - 1. Sets and operations on sets
 - 2. Use of Venn diagrams to represent sets and their relationships
 - 3. Whole number properties and operations
 - 4. Modeling linear change with relations and functions
- C. Numeration Systems
 - 1. Ancient numeration systems (Egyptian, Roman, Babylonian, and Mayan)
 - 2. Counting in whole number positional systems other than base ten
 - 3. Whole number operations in bases other than base ten
 - 4. Commonly used algorithms for the for arithmetic operations and alternative algorithms for these operations
- D. Integers and Number Theory
 - 1. Properties and operations with integers
 - 2. Tests for divisibility
 - 3. Prime factorization and fundamental theorem of arithmetic
 - 4. Greatest common factor (GCF) and least common multiple (LCM) and applying these concepts to problem solving
- E. Fractions and Rational Numbers
 - 1. Fundamental Law of Fractions
 - 2. Ordering rational numbers
 - 3. Properties and operations with rational numbers
 - 4. Applying concepts of GCF and LCM to operations with rational numbers
- F. Decimals, Percents, and Real Numbers
 - 1. Ordering decimals
 - 2. Identifying rational and irrational decimal numbers
 - 3. Properties and operations with decimals
 - 4. Rational expressions generated by repeating decimals
 - 5. Properties of the real number system (closure, commutative, associative, identity, inverse, distributive, denseness)
- G. Applications of Decimals and Percents
 - 1. Application of decimals, ratios and proportions to solve problems dealing with percent